Add and Subtract Decimals

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CONCEPT **1** Add and Subtract Decimals

Here you'll learn to add and subtract decimals with and without rounding.

The student council of F.W. Harris Middle School has decided to open a school store. There always seems to be a need for extra money whether it is for school dances or for sporting events or to help with field trip costs. The student council has students on it from sixth, seventh and eighth grade and they have decided that this will be the best way to tackle fundraising in an ongoing way.

"What do you think Mr. Janus?" Kelly asked of their teacher advisor at the meeting.

"I think that it is a good idea. There will be some up-front costs involved however. Have you thought of how you are going to handle that?" Mr. Janus asked.

"Yes," Tyler responded. "Each grade has some money in their account. We have each decided to use this money to help purchase supplies for the store."

"Alright kids, it seems to me that you have this under control. Why don't you begin by figuring out the sum of the money that you have so that you know what we have to work with?" Mr. Janus suggested.

"Okay, let's start there, Trevor, how much is in the sixth grade budget?" Kelly asked.

Trevor flipped a few pages in his notebook before responding.

"There is $345.67 in the sixth grade budget."

"Okay, let's write that down. Mallory how about seventh grade?"

"There is $504.89 in seventh grade," Mallory answered.

"Great and I know that there is $489.25 in the eighth grade budget," Kelly responded.

"How much do we have to work with?" Trevor asked. "Let's start by estimating."

This is where you come in. This Concept is about adding sums and figuring out differences of decimals. Trevor's suggestion is a great way to begin tackling the sum, with an estimate. Pay attention and you will

learn all about estimating and adding sums with decimals. Then, you will have the chance to solve this problem for yourself.

Guidance

By this point in your learning of mathematics, you have some experience working with decimals. First, let's think about identifying decimals.

What is a decimal?

A *decimal* **is a number that uses a decimal point and place value to show tenths, hundredths, thousandths, and so on.** The decimal point divides the whole number portion from the fractional portion of the number.

35.492

The whole number portion is 35, or 3 tens and 5 ones. The fractional portion is 0.492, or 4 tenths, 9 hundredths, and 2 thousandths. Sometimes there are decimals with both wholes and parts, and sometimes, there are decimals with only parts.

Let's take a look at adding and subtracting decimals.

You can add and subtract decimals by adding according to place value or by rounding the values before adding them.
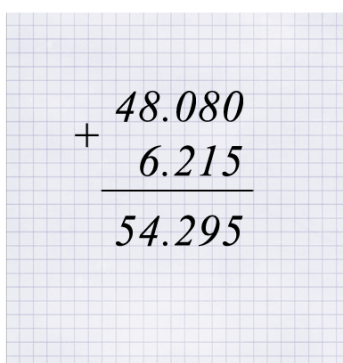
First, let's take a look at adding according to place value.

Add: $48.08 + 6.215$

We can add decimals like we add whole numbers: by lining up the place values. For decimals, this means lining up the decimal points. This means that we add each place value with its common place value. We don't add hundredths and tens. We add hundredths and hundredths. If you think about this logically, it makes perfect sense. Here is what a problem looks like when it is lined up according to place value.

$$
\begin{array}{r}
48.080 \\
+6.215 \\
\hline
\end{array}
$$

Now add each place value, remembering to carry when necessary.

$$
\begin{array}{r}
48.080 \\
+6.215 \\
\hline
54.295
\end{array}
$$

The sum is 54.295

Next, we can find a sum by estimating. Remember that when you *estimate* **you will find an approximate answer, but it will not be exact.**

One way to estimate is by rounding.

We round each value to the nearest whole number. To determine which whole number to round a number to, we look at the decimal portion of the number. If the decimal part is less than .5, then we round down. If the decimal part is .5 or greater we round up.
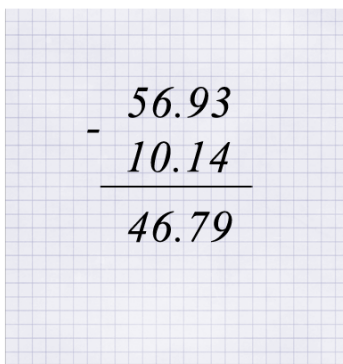
Take a look.

Round 4.56 to the nearest whole number.

4.56 rounds up to 5

We can also subtract decimals by using place value or by rounding.

$56.93 - 10.14$

First, we line up the values according to place value so that we can subtract one from the other.

$$
\begin{array}{r}
56.93 \\
- \underline{10.14} \\
46.79
\end{array}
$$

The difference is 46.79.

We can also find the difference by rounding to the nearest whole number. We round each number to the nearest whole number and then we find the difference between the two values.

56.93 rounds up to 57

10.14 rounds down to 10

$57 - 10 = 47$

Our answer is 47.

Notice once again that the answers are close. This lets us know that our work is accurate.

Example A

Round 2.3 to the nearest whole number.

Solution: 2

Example B

Estimate by rounding $48.08 + 6.215$.

Solution: $48 + 6$ **is our new problem. Our answer is 54.**

Example C

Subtract $49.45 - 6.234$

Solution: 43.216

Now let's go back to the dilemma from the beginning of the Concept.

The first thing that the students need to do is to find an estimate.

To find an estimate, we round each number to the nearest whole number.

$345.67 rounds to $346

$504.89 rounds to $505

$489.25 round up to $490

We add $346 + 505 + 390 = \$1341$

Look at your estimate is it close to this one? Why or why not?

Now we can find the actual sum.

$$
\begin{array}{r}
\$345.67 \\
\$504.89 \\
+\$489.25 \\
\hline
\$1339.81
\end{array}
$$

Notice that our estimate is reasonable given the actual answer. In fact, our estimate is very close to the actual sum.

Vocabulary

Decimal
  a part of a whole. The numbers to the left of the decimal point represent whole quantities. The numbers to the right of the decimal point represent parts.

Estimate
  to find an approximate answer that is reasonable or makes sense given the problem.

Guided Practice

Here is one for you to try on your own.

Subtract the following decimals. First estimate the difference, then check your estimate by subtracting to find an accurate answer.

$5.678 - .82$

Solution

First, we can round 5.678 to 6.

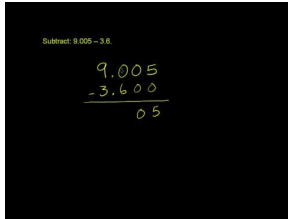Next, we can round $.86$ to 1.

$6 - 1 = 5$

Our estimated difference is 5.

Now let's actually subtract them.

$5.678 - .82 = 4.858$

This is the actual difference. Our estimate was very close to the exact answer.

Video Review

Subtract: 9.005 − 3.8.

9.005
−3.600
‾‾‾‾‾‾
  0 5

KhanAcademySubtractingDecimals

Practice

<u>Directions:</u> Find the exact sum or difference by adding or subtracting the following decimals according to place value.

1. $16.27 + 3.45 = $ _____
2. $22.34 + 9.21 = $ _____
3. $34.5 + 1.234 = $ _____
4. $5.6 + 8.9 = $ _____
5. $1.02 + 12.34 = $ _____
6. $67.89 + 23.45 = $ _____
7. $123.4 + 7.89 = $ _____
8. $34.05 + 102.10 = $ _____
9. $34.56 - 11.23 = $ _____
10. $67.09 - 2.34 = $ _____
11. $88.9 - 13.24 = $ _____
12. $234.5 - 16.7 = $ _____
13. $708.90 - 45.67 = $ _____
14. $27.56 - 1.20 = $ _____
15. $327.66 - 301.20 = $ _____
16. $540.26 - 18.50 = $ _____